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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,486	10/15/2003	Robin Cheung	AMAT/3421.C2/CMP/ECP/RKK	8014
44257	7590	01/11/2006	EXAMINER	
PATTERSON & SHERIDAN, LLP 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			WILKINS III, HARRY D	
			ART UNIT	PAPER NUMBER
			1742	
DATE MAILED: 01/11/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/686,486

Applicant(s)

CHEUNG ET AL.

Examiner

Harry D. Wilkins, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/16/04(x3), 4/26/</u> | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claims 1-9 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-9 of prior U.S. Patent No. 6,136,163. This is a double patenting rejection.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 4 and 9 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 and 10 of U.S. Patent No. 6,635,157. Although the conflicting claims are not identical, they are not patentably distinct from each other because each and every feature of the present claim is present in the claims of the '157 patent.

5. Claims 1 and 4 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 11-14 of copending Application No. 10/972,884. Although the conflicting claims are not identical, they are not patentably distinct from each other because each and every feature of the present claim is present in the claims of the '884 application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 1 and 4 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 14 and 18-20 of copending Application No. 11/114,936. Although the conflicting claims are not identical, they are not patentably distinct from each other because each and every feature of the present claim is present in the claims of the '884 application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 1 recites the limitation "*electrical* processing cells" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Dordi et al (US 6,258,220, US 2004/0084301, 2002/0029961, 6,635,157).

The applied reference has common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

[Each of the further references are related as continuations or divisionals of application no. 09/289,074, which published as US patent 6,258,220.]

12. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Dordi et al (US 6,267,853).

The applied reference has common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al (US 6,264,752) in view of Shinbara (US 6,155,275) and Uzoh et al (US 6,123,825).

Curtis et al teach (see figure 12) a wafer processing apparatus including a mainframe with a wafer transfer robot (625), a loading station (607) and multiple

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processing stations (605) which included electrodeposition cells (see col. 10, lines 10-36) which would necessarily require an electrolyte fluid supply connected to the cell.

Thus, Curtis et al fail to teach including a spin-rinse-dry station between the loading station and the mainframe and a thermal anneal chamber disposed adjacent the loading station.

Shinbara teaches (see figure 1 and related description) a wafer processing apparatus including a spin-rinse-dry station (U3) for cleaning the wafers after processing.

Therefore, it would have been obvious to one of ordinary skill in the art to have included a spin-rinse-dry station as taught by Shinbara in the apparatus of Curtis et al for the purpose of cleaning the wafers after the electrodeposition process. Though Shinbara does not teach positioning the SRD station between the loading station and the transfer robot, it would have been obvious to have placed the stations at any convenient location with respect to the transfer robot without affecting the operation of the apparatus.

Uzoh et al teach (see paragraph spanning cols. 7 and 8) annealing of copper electroplated wafers for the purpose of improving grain structure of the electroplated copper.

Therefore, it would have been obvious to one of ordinary skill in the art to have used a thermal anneal chamber for performing the annealing as taught by Uzoh et al in the apparatus of Curtis et al. Though Uzoh et al do not teach positioning the annealing station adjacent the loading station, it would have been obvious to have placed the

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station at any convenient location with respect to the apparatus without affecting the operation of the apparatus.

Regarding claim 4, it would have been obvious to one of ordinary skill in the art to have added a system controller to the electrodeposition cell of Curtis et al in order to provide precise control over the operating parameters.

15. Claims 2, 3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al (US 6,264,752) in view of Shinbara (US 6,155,275) and Uzoh et al (US 6,123,825) as applied to claims 1 and 4 above, and further in view of Moore et al (US 6,151,447).

The teachings of Curtis et al and Uzoh et al are described above.

Uzoh et al contains no details with respect to the thermal anneal chamber.

Moore et al teach (see abstract and figures) a thermal anneal chamber useful for processing wafers.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the thermal anneal chamber of Moore et al to perform the annealing treatment taught by Uzoh et al because the annealing chamber of Moore et al provided lowered process times by providing rapid heating.

Regarding claim 2, the annealing chamber of Moore et al included a heat plate (327).

Regarding claim 3, the annealing chamber of Moore et al would have been capable of operating at atmospheric pressure.

Regarding claim 5, the annealing chamber of Moore et al included a gas inlet.

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Regarding claim 6, it would have been obvious to one of ordinary skill in the art to have adapted the system controller to have controlled the oxygen content of the gas in the annealing chamber to be less than 100 ppm in order to prevent the electroplated copper layer from becoming oxidized.

Regarding claims 7 and 8, Uzoh et al suggests performing the annealing treatment in a hydrogen-nitrogen atmosphere. Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the annealing chamber of Moore et al to input nitrogen and hydrogen gases. It would have been within the expected skill of a routineer in the art to have optimized the ratio of hydrogen to oxygen of the annealing atmosphere.

16. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis et al (US 6,264,752) in view of Shinbara (US 6,155,275) and Uzoh et al (US 6,123,825) as applied to claims 1 and 4 above, and further in view of Togawa et al (US 5,830,045).

The teachings of Curtis et al are described above. The device of Curtis included multiple wafer transfer robots capable of transferring the wafers to different locations.

Curtis et al are silent with respect to wafer cassettes being utilized and a wafer orientor being used.

However, Togawa et al teach (see figure 1 and abstract) using wafer cassettes for a wafer processing apparatus and including Togawa et al also teach a wafer orientor (5) for ensuring proper orientation of the wafers.

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Curtis et al to receive wafer cassettes as taught by Togawa et

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al in order to decrease labor required to run the reactor by reducing the number of times the operator would have to load wafers into the apparatus. It would have been obvious to one of ordinary skill in the art to have added a wafer orientor as taught by Togawa et al to the apparatus of Curtis et al to have ensured proper orientation of the wafers.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Harry D Wilkins, III
Examiner
Art Unit 1742

hdw